

Two mock suns, such as at times accompany the ordinary halo, were seen also on April 2, and a simple halo also on April 3.

WILLIAM ELLIS

Royal Observatory, Greenwich, April 5

NOTES

WE learn that, at the request of the Royal Society, the Treasury has agreed to insert a sum in the estimates, and the Admiralty has agreed to furnish transport and assistance, in aid of an expedition to observe the total eclipse of the sun, visible in the island of Grenada (West Indies) on August 29 next. The Expedition, which will consist of seven observers, will leave England on July 29 in the Royal Mail s.s. *Nile*. According to present arrangements a ship-of-war will meet them at Barbados, and take them on to their various stations. It is a noteworthy sign of the interest taken in such national work by our great public companies that the Directors of the Royal Mail Company have enabled the Eclipse Committee of the Royal Society to increase the number of observers beyond that at first contemplated by a concession in their terms which amounts to an important endowment of the expedition.

MR. H. FOWLER stated in Parliament the other day that the final report of the expeditions to observe the transit of Venus in 1882, subsidised by the British Government to the extent of 14,680*l.*, would be presented in June.

WE have already announced the death, on March 20, at Leyton, Essex, of Mr. Charles George Talmage, F.R.A.S., in the forty-sixth year of his age. Mr. Talmage, who was well known as a skilful astronomical observer, had the entire direction of Mr. J. Gurney Barclay's observatory at Leyton for more than twenty years. During this period he turned his attention chiefly to observations of double stars, and the results of his work are given in four volumes of the "Leyton Astronomical Observations." Previous to his appointment to this post he had served his apprenticeship to astronomy at the Royal Observatory, Greenwich, in the years 1856-60, had worked under Mr. Hind at Mr. Bishop's observatory, first at Regent's Park, and then at Twickenham, and had spent four years at Nice in order the better to prosecute the work on which he was then engaged, the revision of Admiral Smyth's Bedford Catalogue. He was sent to Gibraltar in 1870 to observe the total solar eclipse of that year, and was placed in charge of the Transit of Venus Expedition to Barbadoes in 1882. His death will be much regretted in the astronomical world and by his numerous friends.

MR. EDWARD SOLLY, F.R.S., F.S.A., died on Friday at Camden House, Sutton, Surrey, in his sixty-seventh year. Educated at Berlin, he was appointed chemist to the Royal Asiatic Society in 1838, Lecturer on Chemistry at the Royal Institution in 1841, honorary member of the Royal Agricultural Society in 1842, Fellow of the Royal Society in 1843, Professor of Chemistry in the East India Company's Military College at Addiscombe in 1845, and honorary Professor of Chemistry to the Horticultural Society in 1846. Besides several works in which the importance of chemistry to agriculture was maintained, he wrote "Rural Chemistry" (1843) and "Syllabus of Chemistry" (1849).

MR. RICHARD EDMONDS, the seismologist and antiquary, died recently at Plymouth in his 85th year. He closely studied the extraordinary agitations of the sea and earthquake shocks, and published the results of his investigations in the *Edinburgh New Philosophical Journal*, the *British Association Reports*, and the *Transactions* of the Royal Society of Cornwall. In 1862 Mr. Edmonds published a collection of his papers, under the title of "The Land's End District; its Antiquities, Natural History, Natural Phenomena, and Scenery."

PROF. OLIVER LODGE will give the first of two lectures at the Royal Institution on Saturday next (April 10) on Fuel and Smoke considered with reference to the scientific principles underlying the use of the one and the avoidance of the other. The following arrangements are announced for the Royal Institution lectures after Easter:—Prof. Gamgee, six lectures on the Function of Circulation; Prof. Dewar, three lectures; Prof. A. Macalister, three lectures on Habit as a Factor in Human Morphology; Prof. Ernst Pauer, three lectures on How to Form a Judgment on Musical Works; and Prof. G. G. Stokes, Pres. R.S., three lectures. The first Friday evening discourse will be given by Mr. Frederick Siemens on Dissociation; and succeeding discourses will probably be given by Prof. J. M. Thomson, Sir John Lubbock, Bart., M.P., Prof. O. Lodge, Dr. W. H. Gaskell, and Prof. Dewar.

THE seventh International Oriental Congress will be held at Vienna on September 27 next and following days.

As the work of unpacking the cases which arrive daily at South Kensington from the British colonies all over the world proceeds, the extraordinary variety and interest of the exhibits become more apparent. In addition to objects of specially scientific interest already referred to, we may mention the ethnological groups in the south or Imperial Court of the Indian section. These are intended to illustrate the physiognomy, dress, and customs of the various races inhabiting the Indian Empire. The collection of woods from the Andaman and Nicobar Islands, shown at the Forestry Exhibition at Edinburgh, has been greatly enlarged, especially by specimens of timber of extraordinary size from the Andamans, and will be shown in the Indian section. One of these, the *Diospyros Kurzii*, a marble wood, resembles a combination of oak and ebony. There will be two timber trophies from the Indian Forest Department; one will be a triple arch 46 feet broad by 15 feet high, containing over 300 kinds of wood, while the second will be formed wholly of bamboo, of which thirty species will be shown. The most original arrangement of woods, however, is that adopted in the Victorian Court. Each specimen is in the shape of an octavo volume, on the back being printed, as a title and place of publication, the scientific name of the wood and the locality whence it came. The whole collection is inclosed in a handsome book-case, and so resembles a small library. Prof. McCoy and Baron von Müller have prepared a large natural history collection, and one of rare plants from Victoria in albums. The entomological collection is said to be remarkably complete, upwards of a thousand distinct specimens of insects being included. The Melbourne Botanical Gardens send a collection of fibres and carpological specimens. In a natural history case in the Canadian section, prepared by Col. Stockwell, will be a general representation of the fauna and flora of Anticosti. New Guinea has been taken under the wing of Queensland, and collections from that island will be explained by Mr. Hugh Romilly, who will be appointed Assistant Commissioner for Queensland specially on this account. The trophies in the various sections will also be of great interest and beauty; Ceylon will have a natural history trophy, India a jungle trophy, Queensland two of natural history—one being animals, the other birds—and so for other courts. It may be hoped that one result of this Exhibition and of the meeting of colonists from all quarters of the globe simultaneously in London will be the establishment of a permanent colonial museum in London. The Exhibition will supply abundant materials with which to make a beginning.

IN commemoration of the fiftieth year of the foundation of the Museum of Native Antiquities at Kiel, the directress, Fräulein Mestorf, has published a hand-book on the prehistoric antiquities of Schleswig-Holstein, containing 62 plates with 765 pictures of

typical prehistoric objects, the originals of which are for the most part in the Kiel Museum. The first 17 plates contain 149 objects of the Stone Age, vessels, flint, horn, and bone implements, and pottery, some of which is decorated; the second section is composed of 18 plates containing 227 objects from the Bronze Age, swords, knives, saws, urns, &c.; lastly, there are 27 plates with 399 objects belonging to the Iron Age, which began in Schleswig-Holstein in the first or second century immediately preceding our era. The last representatives of this series are some silver *denarii* of Charlemagne's time. On the whole the collection appears to be a remarkably complete one for a single province to produce and preserve.

THE third volume of the *Transactions* of the Washington Anthropological Society (November 1883—May 1885) contains a suggestive paper by the President, J. W. Powell, on the growth of barbarism and civilisation from the savage state. This paper, which formed the subject of the annual address delivered on February 3, 1885, deals with the successive stages of savagery, barbarism, and civilisation from a somewhat novel standpoint. It is argued that the evolution of culture, that is, the gradual development of mankind from savagery to civilisation, is essentially the evolution of the humanities—the five great classes of activities denominated arts, institutions, languages, opinions, and intellects. Hence if the course of culture is to be divided into stages, the several stages should be represented in every one of the classes of activities. If there are three stages of culture, there should be three stages of arts, of institutions, and so on. Here the author deals more especially with the essential characteristics of the first two stages, defining the epoch of transition, and explaining how the lower phases of the various activities are developed into the higher. The evolution has everywhere proceeded on the same lines, because the human race is fundamentally one in the strictly genetic sense. The tendency to depart from the original type would doubtless have resulted in the establishment of specific differences, as in the case of other organisms, had it not been checked by various causes arresting free biotic evolution, and bringing about a return to homogeneity. For although much diversity exists it is restricted to narrow limits, the essential characteristics being everywhere the same. Again, after a certain stage is reached, human evolution differs radically from that of all other organisms. It proceeds, not by survival of the fittest, or adaptation of the species to the environment, but on the contrary by adaptation of the environment to the species. There is no aquatic variety of man, no aerial, tropical, boreal, herbivorous, or carnivorous varieties; but man has everywhere adapted the environment to himself, that is, created an artificial environment by his arts, and in general by the development of his inventive and other intellectual faculties. Man has inherited the body, instincts, and passions of the brute; the nature thus inherited has survived in his constitution, and is exhibited along all the course of his history. But man has risen in culture not by reason of his brutal nature; he has been evolved because he has been largely emancipated from the laws of the brute creation. His development has been through the development of the humanities, that is, of those qualities which distinguish him from the brute. It has been a mental and moral far more than an animal evolution. Hence the curious result that, while the mind of man differs immeasurably from that of the next highest in the scale of animal evolution, his body is on the contrary in some respects actually inferior, physically weaker, less able of itself alone to struggle with the adverse conditions of the environment.

THE thirteenth meeting of Scandinavian Naturalists will take place at Christiania between July 7 and 12.

ON the 11th of last month, at about 6.15 p.m., a meteorite fell on the ice off Aastvedt, in the province of Bergen, Norway,

with the effect of making a hole about 18 inches in diameter, though the ice was 8 inches in thickness. It was accompanied by an audible hissing.

THE great success of the oyster cultivation carried on by the Norge Company in the Christiania fjörd has induced the Swedish Government to invite the manager of this establishment to inspect the coast of the province of Bohus, on the opposite side of the fjörd, with a view to the arranging of similar establishments there should the conditions be favourable. A gunboat has been placed at the disposal of the inspector by the Government. The subject is engaging much attention in Sweden, where very few oyster-banks exist.

ON the night of March 30, between 8 and 9 o'clock p.m., there was a very fair display of auroric light in the co. Donegal. Mr. G. H. Kinahan writes:—"At the time the sky to the northward was clear and bright, but after 9 p.m. it became overcast, with dark snow-clouds. The light was peculiar for Ireland, not being of the usual type, but bright light silver-coloured, of the type seen in the autumn in Canada, although far less elaborate. The light extended from the N.W. to the N.E. To the N.E. was a wide column of white light, rather stationary, but at times extending across the zenith in a broad arch to the N.W. horizon. Between this column and the N.N.W. point, being more numerous and prevalent between the N.N.E. and N. points, were pencils and horns of light, even shooting up and down, with clouds of very bright light rising at intervals, and as they rose sent up pencils of light from the upper edges. In the space between the N.E. and N.N.W. points, the pencils of light rose, some perpendicularly, and some obliquely, in a north-easterly direction. Towards the end of the display dull light-reddish clouds rose at intervals, at one time there being a faint marginal edge to the N.E. white column." During the last winter auroræ appear to have been remarkably scarce, for although on the look-out for them all Mr. Kinahan saw were very faint and scarcely perceptible to any one but those who had studied them.

THE American Government have forwarded a consignment of landlocked salmon ova to the National Fish Culture Association, which arrived this week in excellent condition. A large number of this species were reared by the Association last year, and placed in nurseries pending their introduction to the Thames, where it is felt they will thrive well in certain places. The Thames Angling Preservation Society are particularly anxious to naturalise this species in the river, it being an excellent fish from a sporting point of view, and, moreover, it does not migrate to the sea.

THE German Fisheries Union intend to try the acclimatisation of the sterlet in the Vistula and the Oder. About 2000 living sterlets are to be caught in the Save, under the personal superintendence of Prof. Spiridion Brusina, the Director of the Zoological Museum of Agram. They are to be sent to Thorn and to Oderberg respectively for transfer into the two rivers named above. Hitherto sterlets could only be obtained from Russia.

MESSRS. MACMILLAN AND CO. will publish in a few weeks an elementary treatise on Statics, by John Greaves, M.A., Fellow of Christ's College, Cambridge. Although adapted for those beginners whose mathematical reading does not go beyond geometrical conics and trigonometry, the book contains propositions of a more general character, especially in connection with the principle of work, than any other book that does not assume a much wider range of knowledge on the part of the reader. In order to meet the wants of students who can get little assistance in their work, a large number of illustrative examples have been carefully worked out. The mode of treatment chiefly differs

from that usually adopted in that the principle of transmissibility of force is discarded; while the conditions of equilibrium of all bodies, including liquids and flexible strings, are deduced from those of a single particle by means of D'Alembert's principle. The Newtonian definition of force is, of course, the one employed.

THE additions to the Zoological Society's Gardens during the past week include a White-fronted Capuchin Monkey (*Cebus albifrons*) from South America, presented by Mr. Matthews; a Ring-tailed Coati (*Nasua rufa*) from South America, presented by Miss Agnes Shouman; a Common Kingfisher (*Alcedo ispida*), British, presented by Mr. Cuthbert Johnson; two Cambayan Turtle Doves (*Turtur senegalensis*) from Egypt, presented by M. J. M. Cornély, C.M.Z.S.; a Chinese Mynah (*Acridotheres cristatellus*) from China, presented by Mr. T. Douglas Murray, F.Z.S.; a Huanaco (*Lama huanaco*) from Bolivia, two Llamas (*Lama peruana*) from Peru, a Dingo (*Canis dingo*), a Roseate Cockatoo (*Cacatua roseicapilla*) from Australia, two Sonnerat's Jungle Fowl (*Gallus sonnerati*) from Southern India, seventeen Tuatera Lizards (*Sphenodon punctatus*) from New Zealand, deposited; two White-eared Scops Owls (*S. ops leucotis*) from West Africa, a Red and Black Lizard (*Ctenosaura erythromelas*), purchased; two Geoffroy's Doves (*Peristera geoffroyi*) from Brazil, two Blood-breasted Pigeons (*Phlogothanas cruentata*) from the Philippine Islands, received in exchange; a Black Lemur (*Lemur macaco*), an Axis Deer (*Cervus axis*), born in the Gardens.

OUR ASTRONOMICAL COLUMN

AN ASTRONOMICAL DIRECTORY.—M. Lancaster, of the Brussels Observatory, has compiled and published a most useful list of observatories, with their geographical co-ordinates and the astronomers attached to them, of astronomical societies and institutions, and of reviews and journals specially devoted to astronomy. The pamphlet also contains a select list of the names and addresses of those astronomers who are not attached to any observatory, and of amateurs, as well as a further list of makers of astronomical instruments. As is practically inevitable in a work of this nature, there are faults both of omission and of commission noticeable in it. The most conspicuous of the former perhaps occurs in the account of the English *Nautical Almanac* office, where the staff is represented as consisting of the superintendent and one assistant. There are, we believe, as many as eleven assistants attached to this office. A good many mistakes have also been made in the addresses of individual astronomers. We hope that in a second edition M. Lancaster will be enabled to remove these blemishes from what must be considered, on the whole, as a very valuable publication, and one which ought to be in the library of every astronomer who is engaged in the active work of his profession.

ROUSDON OBSERVATORY, DEVON.—Mr. Cuthbert Peek has recently published a short *résumé* of his astronomical work during the years 1882-85, including a description of his private observatory near Lyme Regis. This observatory, of which a photograph is given, is solidly built, and seems to be very thoroughly equipped for its size. It contains a transit instrument, by Troughton and Simms, of 2 inches aperture; an equatorial by Merz, mounting by Cooke, of 6.4 inches aperture; solar and sidereal chronometers; position-circle micrometer by Hilger, &c. Beneath the equatorial room is a room used as a laboratory and for photography. Of the observations, the most important is a monograph on the nebula surrounding η Argus. Mr. Peek had joined the Expedition under the command of Capt. W. G. Morris, R.E., which was sent out to Queensland to observe the transit of Venus in 1882, and, whilst at Jimbour, the place selected as the observing-station, made the observations here recorded. The other observations are of comets 1883 b (Pons-Brooks), 1884 II. (Barnard), 1884 c (Wolf), Encke's comet, the lunar eclipse of 1884 October 4, occultations of Aldebaran, Saturn, Nova Andromedæ, and the meteor-shower of November 27 last. As the observatory was in course of erection during the years 1884 and 1885, and therefore no

systematic work could be undertaken, this record must be considered as very satisfactory.

THE GREAT MELBOURNE TELESCOPE.—The first part of observations of the southern nebulae made with the great Cassegrain reflector at Melbourne has just been published. Other parts, containing the results of observations for the revision of the southern nebulae observed by Sir John Herschel at the Cape of Good Hope in the years 1834 to 1838, the work to which the telescope has been chiefly devoted since its erection in 1869, are to follow at short intervals. The present part contains a description of the instrument itself and of the methods employed in using it, together with observations of some of the smaller nebulae, and it is illustrated by two good photographs representing the great telescope and its surroundings, and by three lithographic plates of the nebulae observed. The report as to the performance of the great telescope is to the effect that on the average of ordinary fine nights it is somewhat disappointing to one accustomed to observe with smaller apertures, but on *really good nights* it is quite different. So large an aperture, that is to say, requires specially good atmospheric conditions for its full powers to be displayed. The number of nights fit for using the telescope is given as about 40 per cent., but of best nights only 17 per cent. Moonlight nights are reckoned as bad nights, as, though used for lunar photography, they are unsuitable for the special work to which the instrument is devoted—the observation of nebulae. The observations of the nebulae given afford several remarkable instances of apparent changes having taken place in a few years. Nebulae Nos. 187 and 567 ("Gen. Cat.") seem to differ from Herschel's description, and the group of four nebulae—Nos. 962, 963, 966, and 968—appear to have altered in their relative positions in a very striking manner in the interval between Mr. Turner's observation in 1876-8 and Mr. Baracchi's in 1884-8. It seems very difficult to explain the differences between the descriptions of this group by Herschel, Turner, and Baracchi.

ASTRONOMICAL PHENOMENA FOR THE WEEK 1886 APRIL 11-17

(FOR the reckoning of time the civil day, commencing at Greenwich mean midnight, counting the hours on to 24, is here employed.)

At Greenwich on April 11

Sun rises, 5h. 15m.; souths, 12h. 1m. 17s.; sets, 18h. 47m.; decl. on meridian, 8° 24' N.; Sidereal Time at Sunset, 8h. 6m.

Moon (at First Quarter) rises, 10h. 15m.; souths, 18h. 6m.; sets, 1h. 52m.*; decl. on meridian, 17° 41' N.

Planet	Rises		Souths		Sets		Decl. on meridian
	h. m.		h. m.		h. m.		
Mercury	4	56	11	43	18	30	8° 31' N.
Venus	3	48	9	14	14	40	7° 26' S.
Mars	14	9	21	15	4	21*	11° 56' N.
Jupiter	16	23	22	37	4	51*	2° 2' N.
Saturn	8	41	16	53	1	5*	22° 51' N.

* Indicates that the setting is that of the following morning.

Variable-Stars

Star	R.A.		Decl.		
	h. m.		° ' "		
Algol	3	0.8	40	31	N. ... Apr. 12, 23 38 m
U Monocerotis	7	25.4	9	32	S. ... 15, 20 27 m
U Canis Minoris	7	35.2	8	39	N. ... 12, m
V Cancri	8	15.2	17	39	N. ... 12, M
R Hydræ	13	23.5	22	42	S. ... 14, m
δ Libræ	14	54.9	8	4	S. ... 11, 4 18 m
R Coronæ	15	43.9	28	30	N. ... 17, m
S Scorpii	16	10.9	22	37	S. ... 15, M
U Ophiuchi	17	10.8	1	20	N. ... 14, 3 52 m
and at intervals of 20 8					
X Sagittarii	17	40.4	27	47	S. ... Apr. 14, 2 20 m
W Sagittarii	17	57.8	29	35	S. ... 13, 21 30 M
β Lyræ	18	45.9	33	14	N. ... 13, 19 10 m ₂
R Lyræ	18	51.9	43	48	N. ... 12, M
S Delphini	20	37.8	16	41	N. ... 13, m
δ Cephei	22	24.9	57	50	N. ... 14, 21 40 M

M signifies maximum; m minimum; m₂ secondary minimum.